



Photo by M. Meyer



# ***Results From the Investigation of Crystallized WINS Impactor Oil***

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# **With a little help from our friends:**

- **Anne Gobin**
- **Chris James**
- **Paul Norton**
- **John Bailey**
- **Trevor Depass**
- **Jon Hopkins**
- **Joe Kowalczyk**
- **Mark Labonte**
- **Pete Menard**
- **Dave Salls**
- **Bill Sowik**

# ***The Six Phases of a Project***

- 1. Enthusiasm**
- 2. Disillusionment**
- 3. Panic**
- 4. Search for the Guilty**
- 5. Punishment of the Innocent**
- 6. Praise and Honor for Nonparticipants**



## *Key Events/Concepts*

- Crystallization noted on AMTIC PM<sub>2.5</sub> Forum 4/5/99.
- Lack of confirmation by others apparently lowered EPA “priority” (‘98/’99 tied for 2nd warmest winter in 100+ years in US).
- The impact of crystallization on WINS performance is unknown.
- Both temperature and humidity are implicated but the precise conditions that initiate crystallization are unknown.
- Once critical conditions are met, crystallization will occur and persist at temperatures approaching 70° F!
- Oil manufacturers have been aware of this phenomenon for quite some time (it’s NOT their fault).

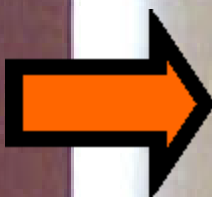


# Tetramethyltetraphenyltrisiloxane

(available from several sources)



# Care and Feeding Instructions



**STORAGE:** Store above 70°F as temporary crystallization may occur. If crystallization should occur, product performance is not diminished. Thaw contents completely and use in normal manner.

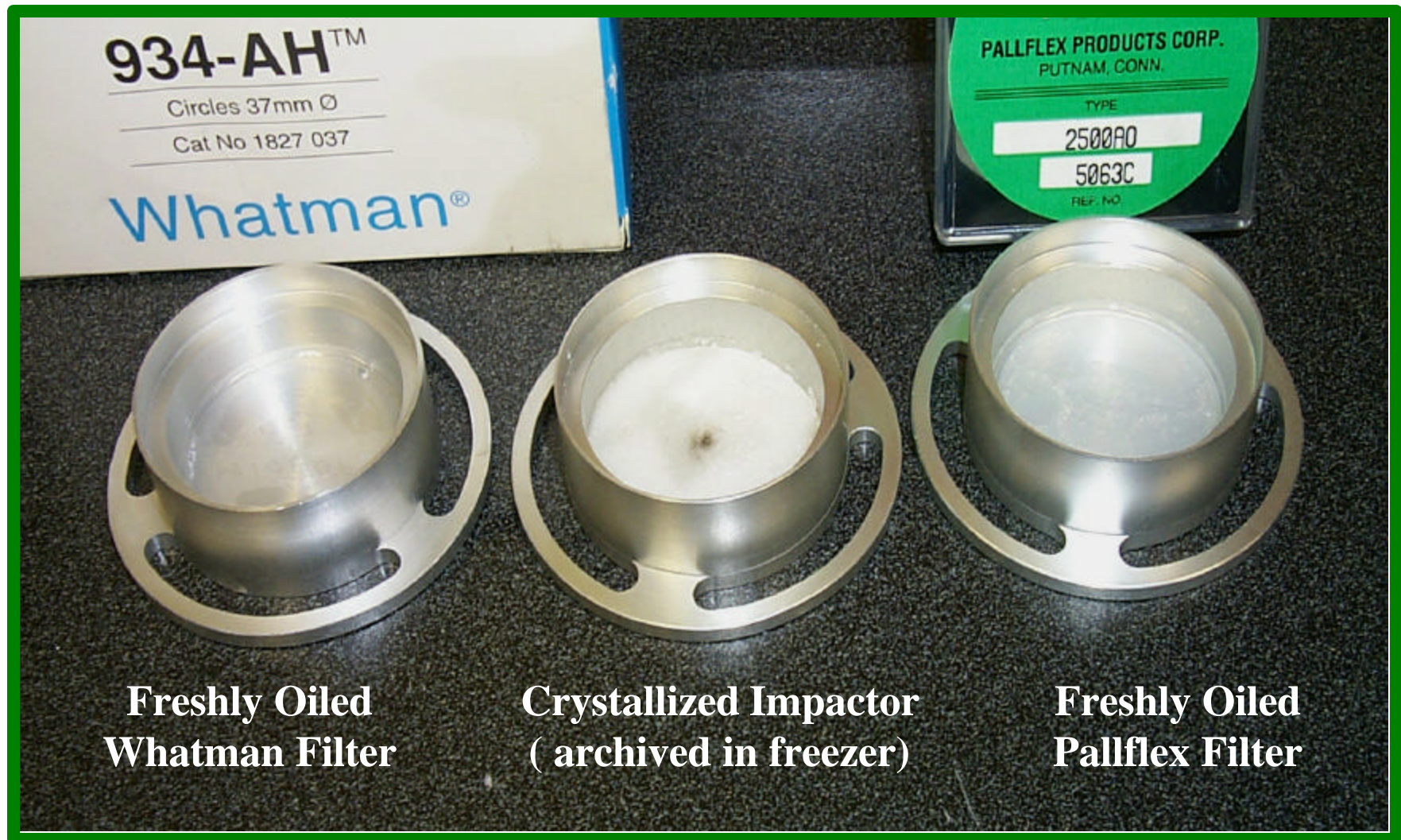
**CONTAINS:**

Tetramethyltetraphenyltrisiloxane/3982829.





# Normal vs Crystallized Impactors



# The Inside Story

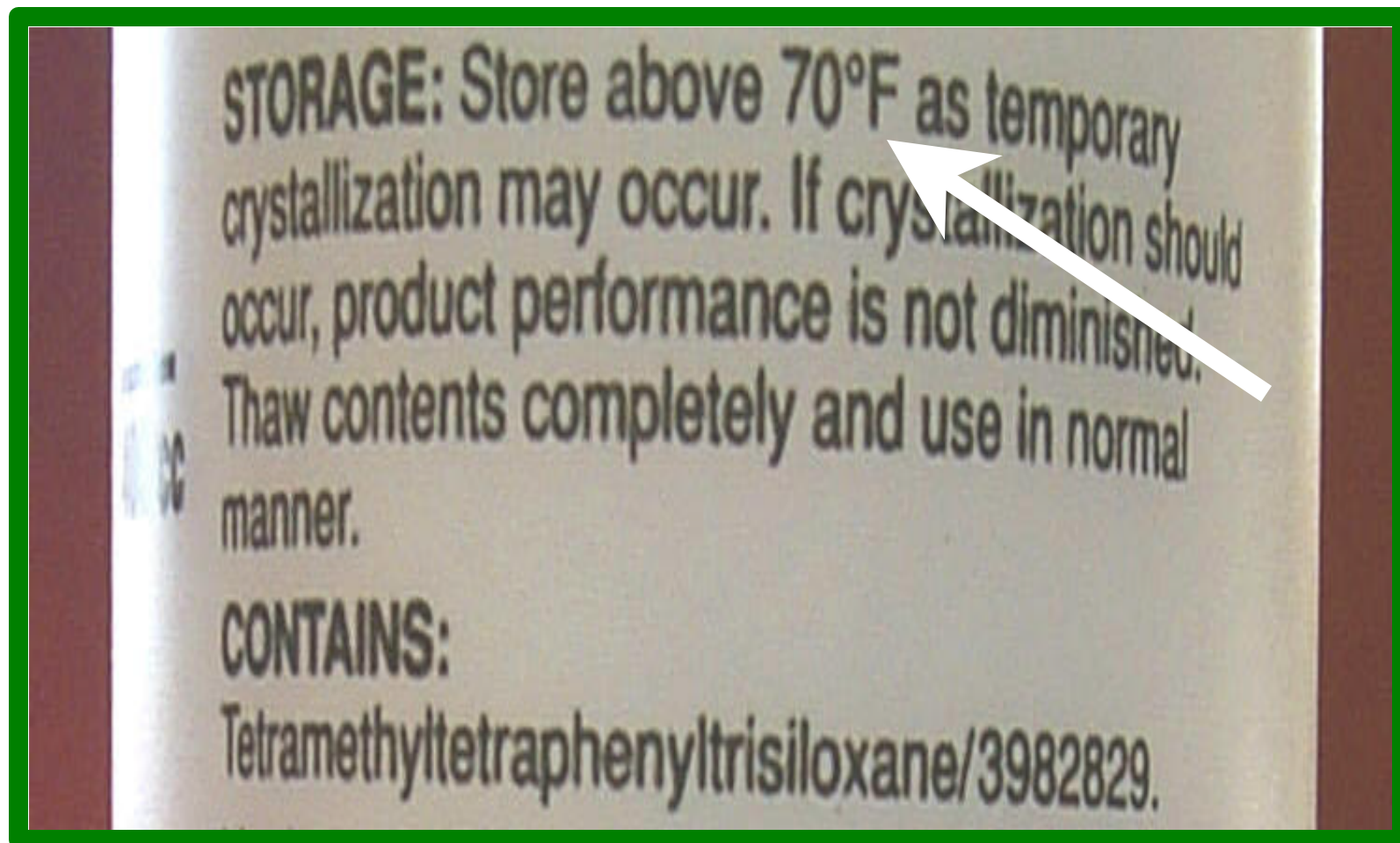




# **Reports of Crystallization May Be Minimized If You:**

- Store oil & service impactors in a climate-controlled area ( $> 70^{\circ}$  F).
- Minimize “open” time of oil reservoir.
- Keep impactors  $> 70^{\circ}$  & install them ASAP.
- Don’t look for it in a timely manner!

# Warm is Good! (fuzzy is optional)







# Special Study Site - 5/28/00



14.1° C. = 57.4° F.





# Crystallized FRM Impactor 5/28/00



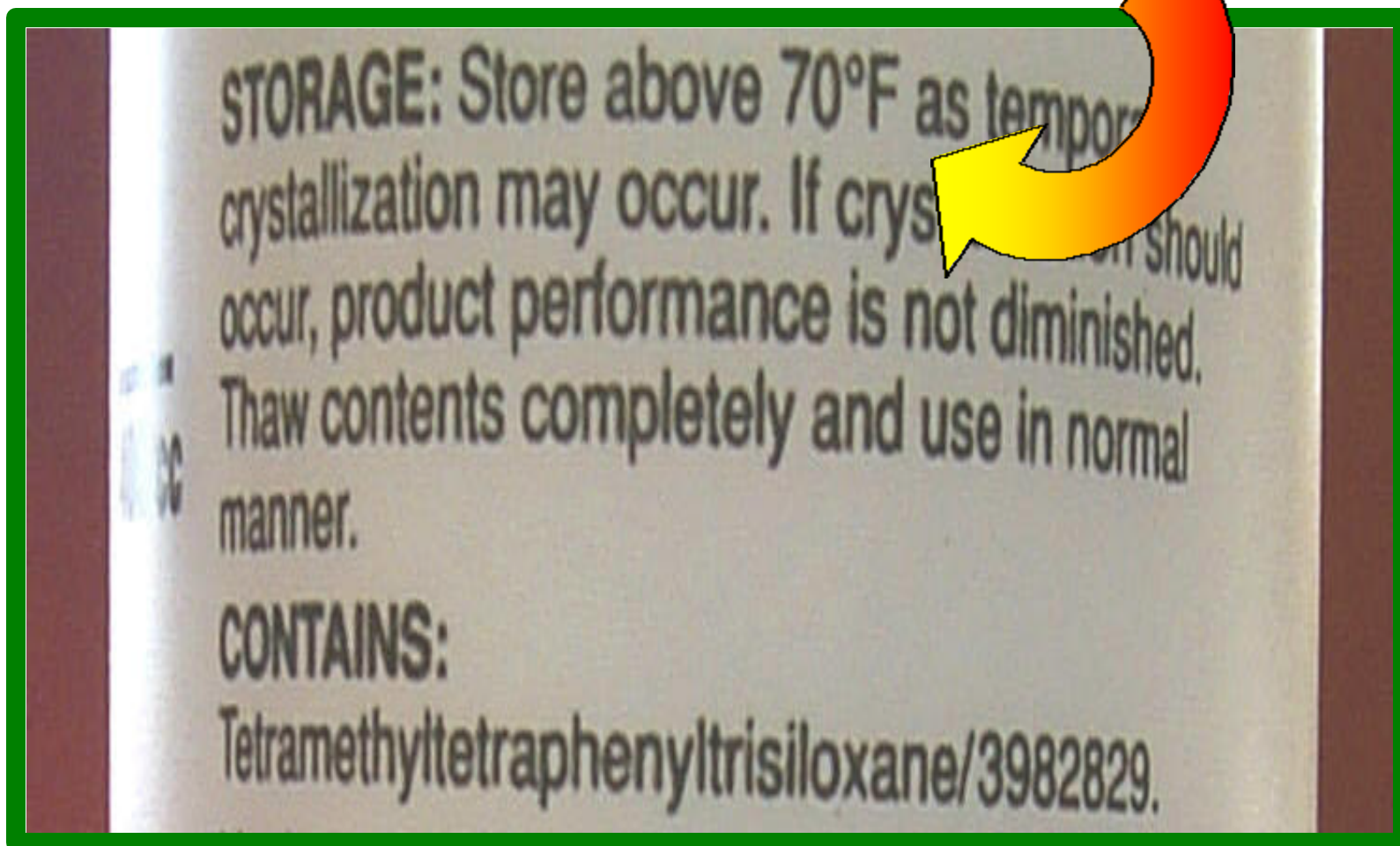




# Crystallized Impactor Close Up



**“Keep Your Powder dry.”  
(and your oil warm!)**





## *Points to Ponder*

- Oil “crystallization” is an often-observed (but not well understood) phenomenon.
- Once initiated, crystallization will persist (possibly at very high temperatures).
- The effect of crystallization on WINS performance is unknown.
- If crystallization does alter FRM performance, data to-date will have a very large uncertainty.



